

EFFECTS OF GROUP SIZE ON AROUSAL ELICITED
FROM VIEWING A VIOLENT STIMULUS

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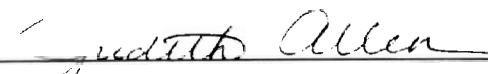
by
Bruce D. Bartholow
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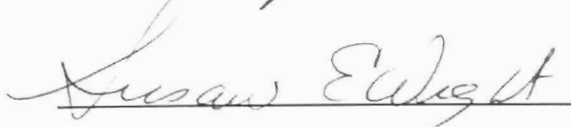
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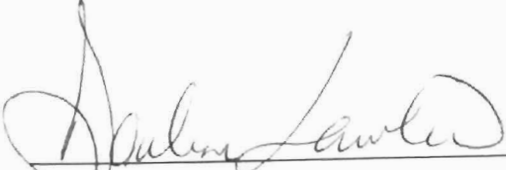
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Abstract

The purpose of the present study was to assess the extent to which the physiological and cognitive effects of viewing violent media were mediated by the presence of other people. It was hypothesized that individuals who watched a violent film clip by themselves would exhibit greater physiological arousal, and would rate the film clip as more violent, than subjects who watched the same film clip in groups, and than subjects who watched a nonviolent film clip. A volunteer sample of 150 undergraduate women were assigned to one of six film viewing conditions, depending on whether they watched the violent or the nonviolent film clip, and on whether they watched the film clip alone or with two or four other persons. Physiological arousal was determined by measuring subjects' heart rate and blood pressure during viewing of the film clips. After viewing the film clips, each subject rated the films on six different cognitive dimensions. Results indicated that group size did not affect film ratings, or systolic or diastolic blood pressure, but a significant difference in heart rate between baseline and peak film viewing was obtained with subjects who watched the violent film clip alone. The findings of this study suggest a possible mediating effect on heart rate of viewing violent media in the presence of other people.

Introduction

The current investigation examined the extent to which physiological responding produced by viewing an arousal-eliciting stimulus is influenced by the social context in which the stimulus is observed. This issue was raised in a recent review of social psychophysiological literature, in which Cacioppo, Berntson, and Anderson (1991) point out that the social environment is a powerful determinant of psychophysiological response which moderates psychophysiological and brain-behavior relationships. These authors also suggest that any studies which measure physiological processes as indices of psychological or behavioral phenomena need to incorporate factors from the social environment in order to fully delineate the nature of any hypothesized outcome. To this end, the present investigation is designed to assess the effects of the number of other people present while viewing an arousal-eliciting stimulus on the cardiovascular responses and cognitions of individuals.

Social Context and Arousal-Eliciting Stimuli

The question of what effect the presence of other people has on psychological states and behaviors is an old one, dating back to the inception of social psychology as a discipline. There are three basic literatures in which the relationship between group size, arousing stimuli, and subject response has been studied: helping behavior in response to emergencies, need for affiliation, and animal behavior research. Most notably, this issue has received significant attention in the helping behavior literature.

Helping Behavior Studies. In their initial studies on the phenomenon referred to as bystander intervention, Darley and Latane' (1968) reported the

interesting finding that the more people who are available to give assistance during an emergency or crisis, the less likely the victim in the situation is to receive help from any of them. This phenomenon struck many people as highly implausible, because it seemed to run contrary to logic and reason (Rosenthal, 1968). Latane' and Darley (1970) offer three possible processes which may account for this finding. The first of these involves "diffusion of responsibility", wherein the presence of others may inhibit a bystander response, presumably by equally distributing the responsibility for helping the victim to each person present or believed to be present on the scene. This shared responsibility may make individual response seem less necessary, and also may lessen the guilt experienced by each individual bystander by diffusing it through other bystanders. It also has been suggested (Schwartz & Gottlieb, 1976) that any anticipated blame for nonresponse is reduced because it is shared by other bystanders. Thus, when more individuals are witness to an emergency, perceived responsibility for helping is predicted by the number of people in the bystander group, such that if there is only one witness, that person bears 100% of the responsibility for providing assistance, whereas if there are two witnesses, each of them bear 50% of the burden, and so on.

A second process described by Latane' and Darley (1970) to account for intervention resistance in emergencies is that of social influence. Social influence is the process by which others in our immediate environment, by their actions, effect our beliefs, attitudes, and behaviors. For the process of social influence to occur, Latane' and Darley (1970) suggest that the observant bystander must be able to visually interpret the response or nonresponse of others. The behavior of other bystanders then provides information about the necessity and/or appropriateness of intervention. In the model proposed by Latane' and Darley (1970), visual observation of the inaction of others

promotes inhibition of individual response. Additionally, Darley and Latane' propose that through social influence, the presence of other people decreases the perceived severity of the incident for an individual. In other words, when a group of bystanders is present, each one of the individual bystanders may feel that the situation constitutes less of an emergency than if they were the sole witness. This interpretation is supported by data obtained in a study conducted by Gaertner, Dovidio, and Johnson (1982). In their study, subjects who believed themselves to be the sole witness of an injury to a confederate on a video monitor reported that the confederate victim's injuries appeared more severe than subjects who witnessed the accident in groups. Darley and Latane' (1970) would explain that this perceptual difference in the presence of others seems to arise out of social comparison, wherein each member of the bystander group observes the response of the others, and concludes, based on the passivity displayed by these others, that the situation must not be as serious as it may otherwise seem. However, if there are no others on the scene to use for behavioral comparison, the incident is taken at face value and perceived to be more urgent.

The third process described in the model proposed by Latane' and Darley (1970) is labeled audience inhibition, which refers to the individual's concern over others' expectations and evaluations of their behavior. Inherent in this process is the individual's desire to optimize or maximize others' evaluations of themselves. According to Latane' and Darley (1970), the anxiety experienced over being evaluated may inhibit a bystander response, especially if the individual feels they may be negatively evaluated for their behavior in the situation. Others (e.g., Schwartz & Gottlieb, 1976) have labeled this phenomenon "evaluation apprehension" to avoid any preconceptions of the direction of the influence others may have on an

individual's behavior via their evaluations of it. In other words, it is plausible that the anxiety experienced due to others' expectations and evaluations may facilitate rather than inhibit an individual's behavior.

Latane and Darley (1970) concluded that any of the above processes - diffusion of responsibility, audience inhibition, and social influence - may sufficiently inhibit a bystander's response to an emergency, but that combinations of these effects are also possible.

Since Darley and Latane's (1968) original work, many other researchers have been prompted to investigate the bystander phenomenon (e.g., Piliavin, et al., 1969; Schwartz & Gottlieb, 1976). From these and other related studies, new theories of explanation for the bystander problem have been generated. Pantin and Carver (1982) postulated that a bystander's self-perceived competence to handle an emergency situation would moderate response to a crisis. In their study, subjects who had been exposed to films containing information related to treatment of medical emergencies responded more quickly to an injured confederate than subjects who had not been given first aid instruction. However, the authors report that subjects who had not seen the films, but were in groups of 1 to 2 during exposure to the emergency, were nearly as quick to respond as those subjects who had seen the films. This was not true of no instruction subjects in 6 member groups. Thus, it appears that when more witnesses are present on the scene, each individual is slower to respond to the situation. Pantin and Carver (1982) explain that each subject may assume that other group members would be better able to handle the situation than themselves, unless they have been given specialized instruction. Additional evidence supporting this view is provided by Shotland and Goodstein (1984), who suggest that perception of personal competence appears to be related to direct crime intervention.

Another interpretation is provided by Piliavin, et al. (1969). In a physiologically related explanation of their data, Piliavin and her colleagues proposed that unpleasant physiological arousal is associated with witnessing an emergency situation, and that individuals are motivated to intervene not for altruistic reasons, but to alleviate their own uncomfortable arousal. Since, as Piliavin (1969) proposed, individuals may be motivated by unpleasant physiological arousal to intervene in crisis situations, and since the presence of additional observers tends to inhibit intervention, it seems reasonable to assume that as the number of witnesses to an arousal-producing stimulus (e.g., an emergency) increases, the physiological arousal of each individual is kept in check as a function of group size.

A study conducted by Gaertner and Dovidio (1977) was one of the first to propose that diffusion of responsibility is characterized by decreased arousal. In their study, Gaertner and Dovidio (1977) replicated earlier findings that subjects who believed themselves to be the sole witness to an emergency responded more quickly and more often than subjects who were aware of the presence of other witnesses. They also reported that cardiac arousal was significantly correlated with latency to intervene in an emergency, such that higher arousal levels led to faster response times. Thus, the authors suggest that subjects who were able to diffuse responsibility by their awareness of other observers showed decreased arousal in response to an emergency, as compared with subjects who were the lone observers.

An interesting connection between the physiological arousal hypothesis of Piliavin et al. and the perceptual difference proposed by Gaertner, Dovidio and Johnson (1982) is provided by research in the area of biofeedback. Biofeedback theory posits that individuals interpret the extent to which they are experiencing fear, pain, or other arousal (e.g., Valins, 1966)

through monitoring their own physiological states. As Piliavin et al. (1969) and Gaertner and Dovidio (1977) have demonstrated, intervention in crises is associated with heightened arousal. Additionally, latency to intervene has been shown to be significantly correlated with arousal level (Gaertner & Dovidio, 1977). Given this evidence of the Piliavin et al. model, and that individuals in larger groups tend to intervene more slowly and less often in emergencies than single individuals, it seems probable that the physiological arousal of observers in groups is lower than that of lone observers.

Proponents of biofeedback theory (e.g., Valins, 1966) would add that since the arousal level of observers in groups is lower, group members' cognitive appraisal of the situation will be proportionally less severe than the appraisal made by any single observer alone, because the observers in groups interpret their "closer to normal" physiological state as indicating that they are not experiencing an urgent situation (Parkinson, 1985). This cognitive interpretation of their arousal presumably would lead to longer response latencies and decreased helping.

The majority of studies done in the area of bystander intervention have assessed an individual subject's latency of response or response/non-response to an emergency situation either alone, or as a member of a group. However, the size of the bystander group has not always been considered an important factor. To determine whether the response latency observed when subjects are a member of a group is a function of the size of the group, a few studies have been conducted more recently using several subject groups of varying sizes (e.g., Sterling & Gaertner, 1984). In a related study using physiological response as the dependent variable, Shearn, Bergman, Hill, Abel, and Hinds (1992) assessed the effects of group sizes varying from a single subject alone, to a subject and 1 confederate, to a subject and 3 confederates on

subjects' blushing in response to an embarrassing stimulus. These authors found that blushing increased significantly as the group size increased from 2 to 4, but not from 1 to 2. Similarly, in a study of deindividuation, Diener, Lusk, DeFour, and Flax (1980) report that self-consciousness and arousal were higher and did not significantly differ for subjects in 1 (alone) or 2 (subject plus 1 confederate) person groups, but that ratings were significantly lower for subjects in 5 person groups. Based on these findings, it appears that the size of the subject group, not merely the presence of one other individual, is an important mediating factor in predicting an individual's response to an arousing event. The present investigation utilized subject group sizes similar to those described above in determining the effects of exposure to an arousal inducing stimulus.

All of the previously described research on bystander behavior in emergencies has firmly established that as number of bystanders increases, at least beyond 2, responsiveness to the situation decreases. However some may question the realism of the mock emergency paradigms used by most of these researchers. Common practice among bystander intervention researchers has been to create the illusion of an accidental injury to a confederate, usually happening within ear-shot of the subjects. For instance, Darley and Latane' (1968) used falling bookcases and a scream of "oh! they're falling on me!!" to elicit a response from subjects in an adjoining room. Sterling and Gaertner (1984) used a phony ladder fall, accompanied by vocalizations like those in the Darley and Latane' (1968) study. Other researchers have used apparent physical illness to a confederate, as in Becker-Haven and Lindskold's (1978) choking victim. While these paradigms do provide information about subjects' helping behavior, at least one limitation of these methods, relevant to the present study, can be identified. This limitation is the fact that very

few studies have examined the component of violence in an emergency situation. It is possible that arousal and intervention provoked by violent stimuli would be different than that provoked by witnessing accidents. At least two studies have been conducted utilizing violent criminal incidents as stimuli. One such study was done by Schwartz and Gottlieb (1976), in which they exposed subjects to a violent theft, either alone or among other observers. A second example is provided by Schreiber (1979), who created a phony shooting in a university classroom. The former study did find that helping was reduced by diffusion of responsibility, while the latter investigation reports finding that students in larger classes were more likely to lend assistance to the victim than students in smaller classes. However, these studies were conducted "in the field" and not in a controlled laboratory environment, and thus were fraught with numerous methodological problems which make interpretation of the findings difficult. In addition, neither study measured physiological responses to the violence. The present study utilized the component of violence in a controlled laboratory, in order to more clearly determine the arousing effects of exposure to a violent conflict.

A third study using violent stimuli was conducted by Bushman and Geen (1990). In an investigation of the role of cognitive-emotional mediators and individual differences on the effects of media violence, Bushman and Geen demonstrated that increasing the violent content of a film clip was related to increases in systolic blood pressure and a measure of hostility. These authors report finding no effect of the size of viewing group on the physiological variables measured (systolic blood pressure) or the ratings of the violent content of the films after viewing. While this finding seems to contradict the logic of the arguments presented thus far, an important

methodological distinction exists between the Bushman and Geen (1990) study and others presented previously. Bushman and Geen report that both before and during the viewing of the films, and during the subsequent rating period after viewing, "participants were seated in cubicles constructed so that no subject could have verbal or visual contact with the others" (1990, p. 158). An important component of the argument presented here, that viewing group size will effect physiological and cognitive variables, is that subjects must have knowledge of one another through visual contact and physical proximity without any barriers between them.

In an earlier study conducted by Geen and Rakosky (1973), violent, aggressive films were used as stimuli, and cardiovascular and electrodermal data were collected. While viewing group size was not mentioned as a factor in this study, the authors do report that heart rates increased as a function of the aggressiveness of the film and the vengefulness of the combatants, even when subjects were reminded that the aggression depicted in the film was fictitious. In the present study, subjects also were aware that the violence they witnessed, while vengeful, was portrayed by actors.

Need for Affiliation Studies. The need for affiliation hypothesis, first proposed by Schachter (1959), provides additional information in explaining the effects that other people have on individuals in arousing situations. The theory states that when confronted with an anxiety producing situation, people prefer to be with others as opposed to being alone. As Wrightsman (1960) explains, people want to be with others when anxious because others provide reassurance and empathy. Wrightsman (1960) reports that subjects, who were in the presence of others and were aware of one another when confronted with an anxiety producing stimulus, and who were not allowed to speak to one another, showed significant decreases in anxiety, as measured by

behavioral observation and responses to an anxiety inventory, as compared to subjects who were alone in the same situation. The connection between need for affiliation and arousal is provided by Thornton, Hogate, Moirs, Pinette, and Presby (1986), who report that the anxiety experienced during cognitive evaluation of situations such as these is associated with heightened physiological response. In an interesting paradigm known as coaction, the effects of affiliation on task performance can be demonstrated. The coaction paradigm usually involves having a group of individuals concurrently and individually perform a task. In a study on the effects of group size and proximity on coaction, Seta, Paulus, and Schkade (1976) note that the majority of the research conducted on coaction has concentrated on the arousal inducing properties of others while practically ignoring the possibility that others may be a source of arousal reduction. The results of their study support the notion that the presence of others can be a source of arousal reduction as well as induction. Seta et al. (1976) explain that in certain situations, individuals may associate the presence of others with a reduction in vulnerability to an aversive situation or outcome, and that this is especially likely if the individuals involved are in a cooperative as opposed to a competitive setting. In the present study, it was also expected that subjects in groups, as opposed to lone subjects, would show decreased anxiety as evidenced by lower physiological arousal.

Animal Behavior Studies

Certain animal models apply to the current study as well. Studies investigating the concept of "safety in numbers" have found that as group size increases, animal behaviors associated with arousal decrease (Marzluff & Heinrich, 1991). For example, in describing characteristics of common ravens, Marzluff and Heinrich (1991) report that foragers display fewer phobic

behaviors, and adult defenders display less aggression as group size increases. Similarly, Davitz and Mason (1955) found that the presence of one rat tended to reduce the strength of the fear response in another rat. In a study relating the findings of animal behavior experiments to humans, Harrell (1990) provides two relevant explanations of his findings that as group size increases, pedestrians become less cautious in street crossing. First, he submits that as group size increases, pedestrians may become less cautious because they are depending on others to check for oncoming traffic, a "diffusion of responsibility" effect. Second, he explains that as more pedestrians attempt to cross, a "safety in numbers" effect may operate, such that individuals feel that their chances of being struck by an oncoming car are greater when they are the lone street crosser than when other pedestrians are crossing also.

Psychophysiological Response to Arousal-Eliciting Stimuli

Ample evidence exists which suggests a link between exposure to arousing or emotional stimuli and changes in both cardiovascular (e.g. Waters, Williamson, Bernard, Blouin, & Faulstich, 1987, Bushman & Geen, 1990) and electrodermal (e.g. Uchino & Cacioppo, 1990, Lang, Greenwald, Bradley, & Hamm, 1993) activity. Uchino and Cacioppo (1990) demonstrated the relationship between emotion-laden stimuli and electrodermal response by showing subjects either neutral or negatively valenced slides. In this study, subjects exposed to the negative stimuli exhibited stronger skin conductance and expressive reactions than subjects who viewed the neutral slides.

The validity of measuring psychological phenomena with physiological means has been discussed at length by such authors as Cacioppo and Tassinary (1990), and Dawson, Schell, and Filion (1990), and has been

tested by several researchers. In an attempt to determine the test-retest reliability of several psychophysiological measures, Waters, Williamson, Bernard, Blouin and Faulstich (1987) assessed the skin conductance level (SCL) and skin conductance response (SCR), heart rate, systolic and diastolic blood pressure, and several other physiological variables in subjects on two separate occasions. These authors report finding test-retest correlations of .70 for SCL, .51 for SCR, .54 for heart rate, and .40 for systolic blood pressure. All of these correlational values are reported as significant. Additionally, their study indicated that all baseline measures were stable from test to retest. Many other researchers in the psychophysiology literature endorse the use of these techniques as determinants of the presence or activation of emotions such as fear, sexual attraction, anger, and excitement, which are commonly associated with arousal (for examples, see Dabbs & Moorer, 1975, Bushman & Geen, 1990, Lang, Greenwald, Bradley, & Hamm, 1993, Geen & Rakosky, 1973).

Summary

The present study attempted to isolate the effect of exposure to violence from the opportunity to intervene or react in a behaviorally direct manner, in an attempt to understand more fully the effect of witnessing violence, either alone or in the presence of others, on physiological responding and cognitive evaluations. None of the helping behavior literature has addressed this question directly. Instead, investigators previously have concentrated on response latency to violent emergency situations (e.g., Schreiber, 1979), or otherwise confounded the effects of observing violence with the measurement of helping behavior or response latency. Literature on responses to aggression has either confounded exposure to violent and aggressive stimuli by intentionally aggravating subjects before exposure (e.g., Donnerstein & Wilson, 1987), and/or has failed to manipulate the group size

variable. Authors of previous research indicate that the social inhibition observed during silent group interaction is not specific to helping behavior (Petty, Williams, Haskins, & Latane', 1977). However, it is likely that viewing stimuli to which no behavioral response is possible, and the knowledge that a behavioral response to that stimuli is not expected, may change arousal. Given this possibility, the present study is valuable for determining the nature of any arousal difference which may be observed when subjects view violence, but cannot respond behaviorally. Therefore, the current investigation involved exposing experimental subjects in 1, 3, or 5 person groups to either a violent or a nonviolent film clip while monitoring their physiological arousal, by means of heart rate, and systolic and diastolic blood pressure. To address the question of perceptual shift in the presence of others, as proposed by Darley and Latane' (1968), subjects in the current study also gave their ratings of the level of violence of the films, as well as their perceptions of other facets of the films.

Hypotheses

Physiological Dependent Measures. The following hypotheses were proposed for the current investigation: a) Subjects viewing the violent film clip will display higher levels of physiological arousal than subjects viewing the nonviolent film clip (consistent with Bushman & Geen, 1990), b) this effect will be moderated by the size of the observer group to which subjects are assigned, such that subjects who viewed the violent film clip in the presence of 4 other observers show a decreased arousal level compared to subjects who view the same clip with 2 other people, and the subjects in these 3 person groups should show decreased arousal level compared with subjects who view the clip alone, c) subjects viewing the nonviolent film clip will not differ in the amount of arousal elicited, no matter the group size.

Cognitive Evaluation Measures. d) Subjects who viewed the violent film clip alone would rate the film as more violent than subjects who viewed the same clip with 2 others, and subjects who viewed the clip in groups of 5 should rate the clip as the least violent, and e) subjects viewing the non-violent clip will not differ in their ratings of the film, regardless of group size.

Method

Subjects

Subjects for the current investigation were 150 female undergraduate students, recruited on a volunteer basis from introductory psychology classes at Drake University¹. No male subjects were used because the possible effects of mixed sex groups were not of interest in the current study, and would be more appropriately assessed in a future study once the group size effect is more clearly understood. Also, a sufficient number of male subjects would have been difficult to obtain from the current subject pool, as females tend to substantially outnumber males in Psychology 1 classes. Subjects were assigned randomly to one of six groups, such that 3 groups of subjects viewed the non-violent video clip, and 3 groups of subjects viewed the violent video. Subject group sizes (n's) equaled 22, 30, and 25 in the 1 person, 3 person, and 5 person viewing groups, respectively, for both violent and nonviolent conditions. Power analysis of the experimental design of this study indicated that for a moderate effect size of .50, 20-30 subjects per cell should be sufficient to achieve the necessary statistical power to detect any significant differences between groups (Rosenthal & Rosnow, 1991; Cohen, 1988).

¹ Ten students were also recruited from the Sociology Department at Drake, as the Psychology subject pool was small.

A possible concern may be raised regarding the recruitment of subjects. Certain pre-existing medical or psychopathological conditions may alter the data collected from certain subjects in an experiment of this type. However, these conditions are assumed to exist with equal frequency across all subject groups, and thus were not controlled in the current study.

Materials

Video Clips. The film clips to be used in the present study were two used previously by Bushman (personal communication, 1994), since rating data describing their level of violent content already had been collected. Since physiological measures of arousal elicited during film viewing can increase for many reasons other than violent content, it is important to note that the two clips used in this study had been previously rated as being not significantly different in such affect-related characteristics as exciting, boring, emotionally moving, and arousing. The film clips also did not differ on measures of how exciting, enjoyable, or frightening they are. However, the two clips did differ significantly on measures of violent content. The clip which had been consistently rated as the more violent of the two is taken from the film "Karate Kid III", and the video clip rated as significantly less violent is taken from the film "Gorillas in the Mist". The film clips had running times of 13.5 minutes and 11 minutes, respectively.

The baseline video clip, approximately 8 minutes in length, depicted an average, sunny day on the campus of Drake University. The clip was shot on a normal weekday, during which students, faculty, and staff are strolling around campus, engaging in conversations, and so on. This clip was viewed by all groups, during which time baseline heart rate and blood pressure levels were sampled. This clip was selected for use in this project because it is an

accurate representation of the kind of stimuli to which subjects are exposed on a daily basis.

Physiological Measures. Heart rate and blood pressure were measured with a Labtron model 02-947 automatic digital sphygmomanometer. This instrument was placed on the top of the desk in which each subject was seated, and subjects were instructed to engage the automatic cuff inflation at the appropriate times throughout the experiment. This method allowed the experimenter to remain out of sight of the subject(s). Baseline heart rate and blood pressure were sampled at the 2 and 6 minute marks during the baseline video clip. Samples were taken at the 2, 5, 7, and 9 minute marks in the "Gorillas in the Mist" (nonviolent) video clip conditions, and the 2, 6, 9, and 12 minute marks in the "Karate Kid III" (violent) clip conditions. Sample periods were approximately 1 minute in length.

Procedures

All subjects were given a statement of informed consent to read and sign before participating in any phase of the experiment. Only 1 subject was unable to agree to the terms of the experiment, and she was dismissed and given credit for volunteering to participate, according to department of psychology guidelines.

Subjects were seated in the viewing room and connected to the physiological measurement devices as described above. In the 3 and 5 person groups, subjects were seated next to one another, where each subject could clearly see the others, but they were asked to refrain from speaking to one another. Upon completion of the informed consent form, subjects received the instructions for the experiment, during which time they practiced using the blood pressure monitors to ensure their efficacy to use them properly during the experiment. After this practice, the experimenter dimmed the

lights and left, and subjects sat quietly in the viewing room for 10 minutes, during which they listened to music which has previously been used to produce a relaxed, neutral mood state in subjects (Allen, 1990, unpublished manuscript, Drake University). When the 10 minute acclimation period passed, the experimenter briefly returned to start the video clip. The baseline video clips were set to segue directly into either the "Gorillas in the Mist" clip or the "Karate Kid III" clip, depending upon condition. Heart rate and blood pressure samples were taken as previously described during the baseline video and experimental video segments.

Upon completion of the experimentally manipulated video clips, all subjects were disconnected immediately from the physiological measurement devices by an experimenter. Subjects then completed a rating scale designed to assess their perceptions of the level of violence contained in the film clip, as well as how exciting, boring, emotionally moving, enjoyable and entertaining each film was perceived to be. Subjects were instructed to rate only the last segments of the video clips they watched; that is, everything they saw after the baseline campus scenes.

Results

Cognitive Data

The questionnaires which subjects completed after viewing the film clips were used primarily as a manipulation check to determine whether the two films differed in perceived violent content. In accordance with previous studies in which the two film clips shown in this study were used (B.J. Bushman, personal communication, 1994), no differences were anticipated among the various film viewing and group size conditions on ratings of any of the cognitive variables other than violence. In order to test for this previous finding, a 2 (Film Type) X 3 (Group Size) factorial analysis of

variance was conducted on subjects' ratings of the films. This analysis revealed a significant main effect of film type for both the ratings of level of film violence, $F(1,149) = 304.5$, $MS_e = 1.08$, $p < .001$, $\eta^2_{\text{partial}} = .67$ and for ratings of film excitement, $F(1,149) = 15.12$, $MS_e = 1.62$, $p < .001$, $\eta^2_{\text{partial}} = .08$. The "Karate Kid III" video clip was rated as both more violent and more exciting than the "Gorillas in the Mist" video clip. No main effect of viewing group size was obtained, indicating that subjects' ratings of the level of violence of either film were not mediated by the size of the group in which they viewed the films. Subjects' ratings of the other cognitive dimensions of the two films - enjoyable, entertaining, emotionally moving, and boring - did not differ significantly, regardless of film type or viewing group size.

Physiological Data

In analyzing the blood pressure and heart rate data, the baseline measure, obtained while subjects viewed the baseline film, was compared to the highest response obtained during the viewing of the violent/nonviolent film (hereafter referred to as "peak"), for all three of the physiological dependent variables. The baseline data used in the analysis was the average of the two samples taken during the baseline period for each subject. The peak is defined as the one sample out of four taken during the viewing of the violent or nonviolent film which represents the highest response observed for each subject on the dependent variable in question (i.e., either heart rate, systolic pressure, or diastolic pressure). These analyses are described separately below for each physiological dependent variable.

Systolic Blood Pressure. To test the effects of film type and viewing group size on subjects' systolic blood pressure, a 2 (Film Type) X 3 (Group Size) X 2 (Time of Measurement) repeated measures analysis of variance was conducted on the systolic blood pressure data, which compared subjects'

baseline systolic pressure to their peak systolic pressure during the viewing of the films. This analysis revealed a significant main effect of time of measurement, $F(1,141) = 14.42, p < .001$. Overall, subjects' systolic pressure increased from baseline ($M = 110.3\text{mmHg}$) to peak ($M = 112.12\text{mmHg}$). A significant two-way (Film Type X Time of Measurement) interaction was also obtained, $F(1, 144) = 24.30, MS_e = 15.02, p < .001, \eta^2_{\text{partial}} = .15$, indicating that subjects' systolic pressure changed differently from baseline to the peak film viewing response, depending on which film clip they viewed. Tukey's comparisons revealed the nature of this difference. In addition to significantly lower baseline pressure and higher peak pressure, subjects in the violent film ("Karate Kid III") condition experienced a significant increase in systolic blood pressure between baseline and peak, while subjects in the nonviolent film ("Gorillas in the Mist") condition did not (see Table 1).

 Insert Table 1 about here

No significant three-way interaction was observed, $F(2,141) = .71, MS_e = 15.02, p = .49, \eta^2_{\text{partial}} = .01$, suggesting that viewing group size did not differentially influence subjects' systolic blood pressure in response to either film.

Diastolic Blood Pressure. To test the effects of film type and viewing group size on subjects' diastolic blood pressure, a 2 (Film Type) X 3 (Group Size) X 2 (Time of Measurement) repeated measures analysis of variance was conducted on the diastolic blood pressure data, which compared subjects' baseline diastolic pressure to their peak diastolic pressure during the viewing of the films. A significant main effect of time of measurement was obtained, $F(1, 141) = 34.09, p < .001$. Diastolic blood pressure increased on average for all

subjects between baseline ($M = 70.85\text{mmHg}$) and peak film viewing response ($M = 74.57\text{mmHg}$). As with the systolic data, a significant two-way (Film Type X Time of Measurement) interaction was observed with the diastolic blood pressure data, $F(1, 141) = 15.84$, $MS_e = 28.23$, $p < .001$, $\eta^2_{\text{partial}} = .10$, which suggests that subjects' diastolic pressure changed differently from baseline to peak depending on which of the films they viewed. Tukey comparisons revealed that subjects who viewed "Karate Kid III" experienced a significant increase in diastolic pressure between baseline and peak, but not subjects who viewed "Gorillas in the Mist". Also, subjects who watched "Karate Kid III" experienced a higher peak response than subjects who watched "Gorillas in the Mist" (see Table 2).

Insert Table 2 about here

No three-way interaction was obtained with the diastolic data, $F(2, 141) = .13$, $MS_e = 28.23$, $p = .88$, $\eta^2_{\text{partial}} = .002$, indicating that the size of the viewing group in which subjects watched the films did not significantly influence their diastolic blood pressure.

Heart Rate. To test the effects of film type and viewing group size on subjects' heart rate, a 2 (Film Type) X 3 (Group Size) X 2 (Time of Measurement) repeated measures analysis of variance was conducted on the heart rate data, which compared subjects' baseline heart rate to their peak heart rate during the viewing of the films. As with the analyses of the blood pressure data, both a main effect of Time of Measurement, $F(1, 141) = 131.42$, $p < .001$, and a significant two-way (Film Type X Time of Measurement) interaction, $F(1, 141) = 13.16$, $MS_e = 25.58$, $p < .001$, $\eta^2_{\text{partial}} = .09$, were obtained. Subjects' heart rates increased from baseline ($M = 68.6\text{bpm}$) to peak

($M = 75.37\text{bpm}$). The two-way interaction was further explained using a post-hoc Tukey procedure, which revealed that subjects in both the violent and nonviolent film conditions experienced significant increases in heart rate during the viewing of the films. However, while peak responses were not significantly different for subjects viewing either film, subjects who saw "Karate Kid III" displayed lower average heart rates at baseline than subjects who saw "Gorillas in the Mist". The two-way interaction was qualified by a significant three-way (Film Type X Group Size X Time of Measurement) interaction, $F(2, 141) = 7.07$, $MS_e = 25.58$, $p = .001$, $\eta^2_{\text{partial}} = .09$. A Tukey follow-up procedure indicated that all subjects, regardless of the film viewed or the size of the viewing group to which they were assigned, experienced similar peak heart rates. However, subjects who watched the violent film clip alone experienced a significantly lower baseline heart rate on average than subjects in all other conditions, except subjects who watched the violent film clip in groups of five. Subjects who watched the violent film alone experienced a significant increase in heart rate from baseline to peak, whereas subjects in the other viewing conditions did not (see Figure 1).

Insert Figure 1 about here

Discussion

Manipulation Checks

Cognitive Data. The questionnaires completed by subjects after the viewing of the film clips were intended to assess each subject's perceptions of the films on several different dimensions. It was expected that subjects in the three violent film viewing conditions would rate the film as more violent

than subjects in the nonviolent film conditions. It was also anticipated that all subjects, regardless of the viewing condition in which they participated, would rate the films similarly on all dimensions other than violence. That is, that all subjects would find the films equally as exciting, enjoyable, entertaining, emotionally moving, and boring, regardless of their viewing condition. This expectation was grounded in the findings of previous research in which the film clips used in this study had been rated by similar subjects (B.J. Bushman, personal communication, 1994). However, analyses of these data in the present study indicated that subjects perceived the "Karate Kid III" film clip to be both more violent and more exciting than the "Gorillas in the Mist" film clip. This finding confirms the hypothesis that subjects who viewed the more violent film clip would rate it as more violent, but does not accord with the hypothesized equivalence in the perceptions of the level of excitement of the two film clips.

One possible explanation of the discrepancy between this finding and those of previous studies is that all subjects used in this project were female, whereas previous studies have included data from both males and females. It is possible that women find the "Karate Kid" film clip more exciting than do men. Since no males were included in this sample, the validity of this explanation cannot be tested statistically in the current study. However, similar gender differences have been noted in other studies in which ratings of arousing films have been measured (Bushman & Geen, 1990). Also, while the difference in ratings of excitement between the violent and nonviolent films was statistically significant, it does not appear to be meaningfully different compared to the difference found between the two films on the ratings of violence. Subjects who viewed the violent film clip indicated a mean level of film excitement of 4.9, while subjects who saw the nonviolent

clip rated its excitability at 4.14. The difference between the violent and nonviolent films on violence ratings was much greater, at 4.8 and 1.8, respectively. Examination of the effect sizes obtained for these variables indicates that the difference in ratings of film violence were more meaningful ($\eta^2_{\text{partial}} = .67$) than the difference in ratings of film excitement ($\eta^2_{\text{partial}} = .08$). Cohen (1977) defines $\eta^2_{\text{partial}} = .08$ as a moderate effect size, and $\eta^2_{\text{partial}} = .67$ as an extremely large effect size.

Physiological Data. The hypothesized difference in physiological arousal between subjects in the violent and nonviolent film conditions was observed for all three cardiovascular measures. This difference is evident in the significant film type X time of measurement interactions revealed by the analyses described above. As expected, subjects in the violent film viewing conditions experienced a greater change in their level of physiological arousal between baseline and peak than subjects who watched the nonviolent film. In the violent film conditions, subjects' systolic and diastolic blood pressure increased significantly from baseline to peak, whereas subjects who viewed the nonviolent film experienced no such increase in blood pressure. A significant difference in heart rate between subjects in the violent and nonviolent film conditions was also noted, but this difference is better understood with relation to the group size effect, which is described below.

Effects of Viewing Group Size

Cognitive Data. A part of the primary hypothesis of interest in the present study was that subjects in the viewing groups of five persons would rate the films as least violent, subjects viewing in groups of three would rate the film as moderately violent, and subjects who viewed the films alone would give the least violent ratings. This effect was only anticipated for the more violent of the two films, as ratings of the less violent film were not

expected to differ, regardless of viewing group size. The hypothesized effect was not observed with the cognitive variables; that is, the size of the viewing group had no significant effect on the ratings given to either film.

Physiological Data. A second part of the primary hypothesis of this study was that subjects who participated in groups of five would experience little or no change in arousal between baseline and peak, as determined by their cardiovascular reactivity, but that subjects viewing the films alone would experience heightened physiological arousal. Subjects participating in groups of three were expected to exhibit a moderate level of physiological arousal, which would fall between that of the subjects in five person groups and that of subjects viewing alone. The hypothesized difference in arousal between subjects in the three person and five person groups was not observed. Thus, the discussion will focus on the arousal differences observed between subjects who participated by themselves and those who participated in groups of either size.

Viewing group size did have a significant effect on the heart rate data obtained from subjects who watched the more violent film, but group size did not significantly effect either systolic or diastolic blood pressure. Inspection of the effect sizes obtained for these variables may help to explain why the obtained differences in heart rate between baseline and peak were significant, while the differences in blood pressure were not. Group size had a moderately large effect on the change in heart rate from baseline to peak, $\eta^2_{\text{partial}} = .091$, while the effects of group size on the change in systolic and diastolic blood pressure were small to very small, $\eta^2_{\text{partial}} = .01$ and $\eta^2_{\text{partial}} = .002$, respectively (for characterizations of effect sizes, see Cohen, 1977). Given that the effect sizes of viewing group size were so small for both the systolic and diastolic blood pressure data, a larger statistical power would

be necessary for changes in pressure between baseline and peak to be significant. However, even if a much larger sample size were employed, the effects of viewing group size on blood pressure would be very small.

Heart rate differences were significantly effected by group size but the blood pressure differences were not. Evidence that social environments are more prone to elicit heart rate reactivity than blood pressure reactivity is provided by Baker et al. (1993), who reported that subjects' maximum heart rates were significantly higher during periods of social stress, but that blood pressure was not significantly affected. Previous research has also suggested a gender-based explanation of these data, in that women may experience more heart rate reactivity, and less systolic blood pressure reactivity when confronted with potential social evaluation (Burns & Katkin, 1993).

In support of the primary hypothesis, the data indicated that subjects who watched the more violent film clip by themselves experienced a significant increase in heart rate from baseline to the peak response during the viewing of the clip, while subjects who watched the same film clip in groups of three or five persons exhibited no significant increase in heart rate throughout the viewing of the clip.

This finding may be most useful when combined with the results of previous studies in which group dynamics was a primary dependent variable. For instance, Wrightsman (1960) and others have reported that subjects in anxious or threatening situations and environments prefer to be with others as opposed to being alone. When interpreted in light of the current study, one reason for this finding may be that subjects are more physiologically aroused when alone in threatening situations, and the presence of others who are similarly situated makes individuals feel safer and more comfortable (i.e., less physiologically aroused). This comparison assumes that the violent

film clips shown in the present study created an anxious environment for the subjects. This is a reasonable assumption in light of subjects' level of arousal, which can be considered a determinant of anxiety.

In a study which examined subjects' arousal from and perceptions of the violence of several film clips, Bushman and Geen (1990) reported no effect of viewing group size on self-report ratings of film violence; a finding similar to that reported in the present study. However, contrary to the findings of the current study, Bushman and Geen report that the size of the viewing group did not influence physiological arousal. A procedural difference between the current study and that of Bushman and Geen (1990) may explain this discrepancy. In the current study, subjects who participated in the group conditions were seated in normal classroom-style desks directly adjacent to one another, in full view of each other, and thus each individual was obviously aware of the presence or absence of other subjects. In their study, Bushman and Geen report that participants were seated in cubicles constructed so that no subject could see or speak with the others, implying that subjects may not have been aware of the presence of others. Awareness of the presence of others in the environment has been argued here to be a necessary condition for the hypothesized arousal-reducing effect of other people on an individual.

The results of this study are also interesting when viewed alongside the findings reported by researchers investigating the phenomenon of bystander intervention in emergency situations. It has been widely reported that, as the size of the bystander group in an emergency situation increases, the chances that any one bystander will intervene to help decreases (e.g., Darley & Latané, 1968). One theoretical perspective on this problem which has received experimental support was originally advanced by Piliavin et al.

(1969). This perspective holds that witnessing an emergency situation creates a detectable and uncomfortable physiological arousal in the individual bystander, and that she intervenes to help not for altruistic reasons, but rather in an effort to reduce this uncomfortable arousal. Gaertner and Dovidio (1977) demonstrated that cardiac arousal is significantly correlated with latency to intervene in an emergency, such that higher arousal levels lead to faster response times. They suggested that subjects who were able to diffuse responsibility by their awareness of other observers showed decreased arousal in response to an emergency, as compared with subjects who were the lone observers. Therefore, since arousal and speed of response to an emergency are positively correlated, and since the presence of other people inhibits the response of an individual bystander, the theory would posit that the presence of other people during an arousal-inducing event would serve to keep the arousal of each individual in check. The findings of the current study are consistent with this idea, as lone viewers of the violent film exhibited a greater increase in cardiac arousal than those who viewed this arousal-inducing film along with other participants.

The present study also may serve to expand the current understanding of the bystander phenomenon, as the results reported here indicate that exposure to a violent event in which there is no possibility of lending assistance produces a pattern of results similar to experiments in which participants have an opportunity to help. As stated by Sterling and Gaertner (1984), people are indeed aroused by the observation of a victim in distress. The results of the current investigation suggest that perhaps the more violent the situation leading to a victim's distress, the more aroused a bystander may become, and the more profound may be the effect of the presence of other people in alleviating some of that arousal.

In analyzing the change in heart rate observed for subjects who saw the more violent film clip alone, it may be tempting to explain the results of this experiment as being due to observation by an experimenter, which could lead subjects to exhibit increased heart rate activity. According to the social impact theory proposed by Latané and Nida (1979), the impact of onlookers is lessened by increases in the number of people in a group. Although the experimenter was in an adjacent room from the subjects during their participation, subjects may have known that the experimenter was watching them through a two-way mirror throughout the experiment. This observation by an onlooker (the experimenter) may have created a feeling of social uneasiness for the subjects who participated alone, and this uneasiness may have been lessened by the feeling of membership in a group for those subjects who participated with others. However, this explanation does not sufficiently account for the pattern of results obtained in this study, because the subjects who participated alone but watched the less violent film did not experience the significant change in heart rate exhibited by the lone subjects who saw the more violent film.

While the hypothesized change in heart rate did occur for subjects who watched the violent film with no other people present, this finding could be considered tenuous, in light of the fact that these subjects did not experience a higher peak pulse rate which made their data differ significantly from the others, but instead these subjects had a significantly lower baseline heart rate. The hypothesis predicted that subjects who viewed the more violent film by themselves would experience more heightened cardiovascular activity than subjects who watched that same film in groups, suggesting a greater peak response for the lone subjects. However, peak responses for all subjects who watched the more violent film were quite similar. There is no theoretical

mechanism to explain why subjects watching the more violent film by themselves would experience a lower time 1 (baseline) heart rate than subjects in the three-person and five-person viewing conditions. When examined from the perspective of the amount of change in heart rate occurring between baseline and peak, the hypothesis that lone viewers of the more violent film would experience a greater change in arousal from baseline to peak than viewers in groups is supported, but when absolute peak response is used as the determinant of the effect of group size, no significant difference is observed. Therefore, additional studies replicating these conditions are needed before any firm conclusions can be drawn regarding the potential moderating effect of group membership on cardiovascular reactivity to violent media.

Several shortcomings in the design of this study can be identified. First, the intent of the study was to show subjects in the violent film condition a film which would be violent enough to elicit a reliably strong reaction. While the "Karate Kid III" film clip did produce more physiological arousal, as evidenced by the cardiovascular data, than did the "Gorillas in the Mist" film clip, it may not have been violent enough to allow for a potential group size effect to be strongly demonstrated. Many subjects commented that the "Karate Kid III" film was too "corny" to be taken very seriously, and thus they may not have been strongly effected by its somewhat violent content. Geen and Rakosky (1973) report that fictional demonstrations of violence which is self-defensive or directed toward monetary goals elicits less arousal and aggressive behavior than portrayals of vengeance. The violence portayed in the "Karate Kid III" film clip is self-defensive in the first two scenes and directed toward monetary goals (trophy and recognition) in the third, and therefore may be inappropriate for the type of physiological effect which was

sought in this experiment. For the presence of others to adequately produce the hypothesized arousal-reducing effect, a more violent, vengeful, and perhaps more frightening film clip may need to be used.

Another shortcoming relevant to the films used is that no pre-screening was done to determine which subjects had previously seen the films from which the clips for this study were taken. It is likely that someone seeing a piece of film for the first time will react to it differently than someone who has seen it before, perhaps numerous times. Furthermore, it is likely that a person seeing a violent film for the first time will not know exactly what to expect, and thus will potentially respond with greater arousal than someone who has been exposed to the scenes previously.

The group dynamics used in this study could have been altered to include groups of people with different social status, which may have effected arousal. For example, groups of friends may exhibit different responses than groups in which all subjects are strangers prior to participation. While this variable was not manipulated in the present study, some subjects did indicate prior acquaintanceship with others which may have effected their level of comfort with the experimental environment. Also, groups of males and mixed-sex groups would likely create a different environment than that created by the all female groups of this study, and that different environment could lead to unique changes in the physiological arousal of the group members.

The design of the present study did not permit the assessment of any individual differences between any of the subjects. Individual differences have been suggested as a moderating factor in cognitive and emotional responses to social interaction (Palm & Ohman, 1992), and violent media (Bushman & Geen, 1990). Bushman and Geen report that the effects of

individual differences are strongest when moderately violent videotapes were shown to subjects, indicating that in these conditions individual differences were not overpowered by situational cues. As discussed earlier, the film clip used in this study for the "violent" conditions was actually quite moderate in violence, as indicated by the moderate ratings it received from subjects who watched it ($M=4.75$, where 1= not at all violent and 7= extremely violent). Therefore, inclusion of individual differences such as trait aggressiveness or Type A vs. Type B behavior pattern as predictors of cardiovascular reactivity may have been important for improving the design of the present study.

In conclusion, this study did provide information which may be useful to the literature on group dynamics and the arousal potential of certain stimuli when witnesses are alone and with others. For that reason, researchers investigating the bystander phenomenon and/or affiliative tendencies may be most interested in the results. A further understanding of the effects of the presence of others on the experience of physiological arousal, and how arousal may affect perceptions of events, may lead to an increased consideration of group dynamics in the design of social psychological research paradigms, and possibly could promote greater awareness of the effects of witnessing and participating in violence in group settings.

References

- Allen, J.A., (1990), The influence of affective states on cognitive representations of racial stereotypes, Unpublished manuscript, Drake University, Des Moines.
- Baker, C.F., Garvin, B.J., Kennedy, C.W., & Polivka, B.J., (1993), The effect of environmental sound and communication on CCU patients' heart rate and blood pressure, *Research in Nursing and Health*, Vol. 16, 415-421.
- Becker-Haven, J.F., Lindskold, S., (1978), Deindividuation manipulations, self-consciousness, and bystander intervention, *Journal of Social Psychology*, Vol. 54, 113-121.
- Burns, J.W., & Katkin, E.S., (1993), Psychological, situational, and gender predictors of cardiovascular reactivity to stress: A multivariate approach, *Journal of Behavioral Medicine*, Vol. 16, 445-465.
- Bushman, B.J., & Geen, R.G., (1990), Role of cognitive-emotional mediators and individual differences in the effects of media violence on aggression, *Journal of Personality and Social Psychology*, Vol. 58, 156-163.
- Cacioppo, J.T., Berntson, G.G., & Anderson, B.L., (1991), Psychophysiological approaches to the evaluation of psychotherapeutic process and outcome, 1991: contributions from social psychophysiology, *Psychological Assessment*, Vol. 3, 321-336.
- Cacioppo, J.T., & Tassinary, L.G., (1990), Inferring psychological significance from physiological signals, *American Psychologist*, Vol. 45, 16-28.
- Cohen, J., (1977), *Statistical Power Analysis for the Behavioral Sciences*, New York: Academic Press.

- Cohen, J., (1988), *Statistical Power Analysis for the Behavioral Sciences*, New York: Random House.
- Dabbs, J.M., & Moorer, J.P., (1975), Core body temperature and social arousal, *Personality and Social Psychology Bulletin*, Vol. 1, 517-520.
- Darley, J.M., & Latane', B., (1968), Bystander intervention in emergencies: a diffusion of responsibility, *Journal of Personality and Social Psychology*, Vol. 8, 377-383.
- Davitz, J.R., & Mason, D.J., (1955), Socially facilitated reduction of a fear response in rats, *Journal of Comparative Physiological Psychology*, Vol. 48, 149-151.
- Dawson, M.E., Schell, A.M., & Filion, D.L., (1990), The electrodermal system, in Cacioppo, J.T., & Tassinary, L.G., (Eds), *Principles of Psychophysiology: Physical, Social, and Inferential Elements*, New York: Combridge Universty Press.
- Deiner, E., Lusk, L., DeFour, D., & Flax, R., (1980), Deindividuation: effects of group size, density, number of observers, and group member similarity on self-consciousness and disinhibited behavior, *Journal of Personality and Social Psychology*, Vol. 39, 449-459.
- Donnerstein, E., & Wilson, D.W., (1987), The effects of noise and perceived control upon ongoing and subsequent aggressive behavior, *Journal of Personality and Social Psychology*, Vol. 50, 774-781.
- Edelberg, R., (1972), Electrical activity of the skin: its measurement and uses in psychophysiology, in Greenfield, N.S., & Sternbach, R.A., (Eds.), *Handbook of Psychophysiology*, Chicago: Holt, Reinhart and Winston.
- Gaertner, S.L., Dovidio, J.F., & Johnson, G., (1982), Race of victim, nonresponsive bystanders, and helping behavior, *Journal of Social Psychology*, Vol. 117, 69-77.

- Gaertner, S.L., Dovidio, J.F., (1977), The subtlety of white racism, arousal, and helping behavior, *Journal of Personality and Social Psychology*, Vol. 35, 691-707.
- Geen, R.G., & Rakosky, J.L., (1973), Interpretations of observed aggression and their effect on GSR, *Journal of Experimental Research in Personality*, Vol. 6, 289-292.
- Harrell, W.A., (1990), Factors influencing pedestrian cautiousness in crossing streets, *Journal of Social Psychology*, Vol. 131, 367-372.
- Latané, B., & Darley, J.M., (1970), *The unresponsive bystander - Why doesn't he help?*, New York: Appleton-Century-Crofts.
- Latané, B., & Nida, S., (1979), Social impact theory and group influence: A social engineering perspective, In P. Paulus (Ed.), *The psychology of group influence*, Hillsdale: Erlbaum.
- Lang, P.J., Greenwald, M.K., Bradley, M.M., & Hamm, A.O., (1993), Looking at pictures: affective, facial, visceral, and behavioral reactions, *Psychophysiology*, Vol. 30, 261-273.
- Marzluff, J.M., & Heinrich, B., (1991), Foraging by common ravens in the presence and absence of territory holders: an experimental analysis of social foraging, *Animal Behavior*, Vol. 42, 755-770.
- Palm, T., & Ohman, A., (1992), Social interaction, cardiovascular activation and type A behavior pattern, *International Journal of Psychophysiology*, Vol. 13, 101-110.
- Pantin, H.M., & Carver, C.S., (1982), Induced competence and bystander effect, *Journal of Applied Social Psychology*, Vol. 12, 100-111.
- Parkinson, B., (1985), Emotional effects of false automatic feedback, *Psychological Bulletin*, Vol. 98, 471-494.

- Petty, R.E., Williams, K.D., Haskins, S.G., & Latane', B., (1977), Social inhibition of helping yourself: bystander response to a cheeseburger, *Personality and Social Psychology Bulletin*, Vol. 3, 575-578.
- Piliavin, J.M., Piliavin, J.A., & Rodin, J., (1969), Good samaritanism: an underground phenomenon?, *Journal of Personality and Social Psychology*, Vol. 13, 289-299.
- Rosenthal, A.M., (1964), *Thirty-eight witnesses*, New York: McGraw-Hill.
- Rosenthal, R., & Rosnow, R.L., (1991), *Essentials of Behavioral Research: Methods and Data Analysis* (2nd ed.), New York: McGraw-Hill.
- Schachter, S., (1959), *The Psychology of Affiliation*, Stanford: Stanford University Press.
- Schreiber, E., (1979), Bystander's intervention in situations of violence, *Psychological Reports*, Vol. 45, 243-246.
- Schwartz, S.H., & Gottlieb, A., (1976), Bystander reactions to a violent theft: crime in Jerusalem, *Journal of Personality and Social Psychology*, Vol. 6, 1188-1199.
- Seta, J.J., Paulus, P.B., & Schkade, J.K., (1976), Effects of group size and proximity under cooperative and competitive conditions, *Journal of Personality and Social Psychology*, Vol. 34, 47-53.
- Shearn, D., Bergman, E., Hill, K., Abel, A., & Hinds, L., (1992), Blushing as a function of audience size, *Psychophysiology*, Vol. 29, 431-436.
- Shotlund, R.L., & Goodstein, L.I., (1984), The role of bystanders in crime control, *Journal of Social Issues*, Vol. 40, 9-26.
- Sterling, B., & Gaertner, S.L., (1984), The attribution of arousal and emergency helping: a bidirectional process, *Journal of Experimental Social Psychology*, Vol. 20, 586-596.

- Thornton, B., Hogate, L., Moirs, K., Pinette, M., & Presby, W., (1986),
Physiological evidence of an arousal-based motivational bias in the
defensive attribution of responsibility, *Journal of Experimental Social
Psychology*, Vol. 22, 148-162.
- Uchino, B.N., & Cacioppo, J.T., (1990), The relationship between facial
expressiveness and sympathetic activation in emotion: an empirical
study, *Psychophysiology*, Vol. 27, S70 (abstract).
- Valins, S., (1966), Cognitive effects of false heart rate feedback, *Journal of
Personality and Social Psychology*, Vol. 4, 400-408.
- Waters, W.F., Williamson, D.A., Bernard, B.A., Blouin, D.C., & Faulstich,
M.E., (1987) Test-retest reliability of psychophysiological assessment,
Behavior Research and Therapy, Vol. 25, 213-221.
- Wrightsman, L.S., (1960), Effects of waiting with others on changes in level of
felt anxiety, *Journal of Abnormal and Social Psychology*, Vol. 61, 216-
222.

APPENDIX A
Video Clip Rating Questionnaire

By answering the questions on this page, please rate your feelings about the film clip you just watched, using the following 7 point scale:

1	2	3	4	5	6	7
Not at all			Moderately			Extremely

1. How violent were the scenes depicted in the video clip?

1	2	3	4	5	6	7
Not at all						Extremely
Violent						Violent

2. How exciting were the events depicted in the video clip?

1	2	3	4	5	6	7
Not at all						Extremely
Exciting						Exciting

3. How enjoyable was the video clip you just saw?

1	2	3	4	5	6	7
Not at all						Extremely
Enjoyable						Enjoyable

4. Would you say that the video clip you watched was entertaining?

1	2	3	4	5	6	7
Not at all						Extremely
Entertaining						Entertaining

5. To what extent did you feel emotionally moved by the events in the video clip?

1	2	3	4	5	6	7
Not at all						Extremely
Moved						Moved

6. Would you say that the video clip was boring?

1	2	3	4	5	6	7
Not at all						Extremely
Boring						Boring

APPENDIX B

Instructions to Participants

As you read on the Informed Consent Form, I will be measuring your heart rate and blood pressure while you watch some film clips. Before getting started, I want to instruct you on how to use the blood pressure monitors on your desks. I'll start by helping (each of) you attach the cuff(s).

(Experimenter attaches blood pressure cuffs to upper right arm of each subject)

Several times throughout the experiment, I will be instructing you over the intercom to inflate the cuff by pressing the red button labeled "start". Let's try that now.

(Have subjects press "start" to begin inflation of cuffs, continue with instructions during inflation and measurement)

While the unit is taking your measurement, please be as still as possible, or the machine may not operate properly. Please leave your arm resting flat on the desk, pointing straight out in front of you. The machine will take your measurement for approximately one minute. Once you feel the cuff deflate, the machine has finished your measurement. At this point, please wait eight seconds, and then press the "print" button, located just below the "start" button. If the machine does not print after you press the button the first time, please wait a few seconds and press "print" again.

(Have subjects print out their readings, then collect these and discard)

During the experiment, I will also ask you to turn the machine(s) off and on a few times. Do this by flipping the on/off switch in the appropriate direction - left for on, right for off. You may all turn your machines off for now.

Please pay close attention to the films throughout the course of the experiment. It is very important that you be aware of what is happening on the screen. Are there any questions? Do you (all) understand how to use the

blood pressure monitors? Do you (Does anyone) need your (their) cuff adjusted?

(Field questions, if any.)

Now, before you begin watching the films, I want you to sit quietly in the room for a few minutes, to allow you get used to the room and get used to having the cuff on you arm. Also, this time will ensure that your heart rate(s) is (are) at a resting level before we begin the experiment.

During this time, I'm going to turn on some music for you to listen to to help pass the time. Please do not fall asleep (and please refrain from speaking to one another). When the music finishes, I will return to start the video tape.

(Start the tape, turn down the lights, leave the room)

(When music is over, briefly return to the room and press "play" to start the video tape.)

AFTER VIDEO TAPE IS OVER

(Return to the room, stop the VCR, remove cuff(s) from subject(s). Give subject(s) video clip rating questionnaire(s) and pencils.)

Now I would like you to fill out a short questionnaire, to get your opinions on the film clip you just watched. Please read the directions at the top of the page very carefully. Please rate only the last of the two video clips you saw; that is, everything after the campus scenes. Are there any questions? (Leave room while subject(s) complete questionnaire. When all are finished, return, collect the questionnaires, debrief and dismiss the subjects.)

APPENDIX C
Informed Consent Form

Informed Consent Form

The purpose of this study is to investigate how watching different films influences people's moods. As a result of this research, we hope to gain an understanding of just how films might effect people's feelings about certain issues. In order to study this, you will be asked to watch a couple of film clips while your heart rate and blood pressure are monitored. After watching the film clips, you will be asked to complete a pencil and paper questionnaire which asks for your feelings about the film clips.

The equipment used in this experiment to monitor your heart rate and blood pressure is similar to that which you would encounter in a visit to a doctor's office for a check-up. This equipment is specifically designed for the types of procedures used in this study. Be assured, the risk of injury from these procedures is no greater than that which you would experience in a non-invasive physical examination by a physician. If you would like to view the equipment before agreeing to participate in this experiment, you may do so. If you have any questions regarding the equipment or its usage in this experiment, please feel free to ask the experimenter.

You are in no way obligated to participate in this study. Should you decide to withdraw from this study, you may freely do so at any time without penalty. At the end of this study, please feel free to ask any questions you may have. If the experimenter cannot answer your questions completely, please feel free to call Dr. Brian Sanders (271-2043) or Dr. Judith Allen (271-2861).

By signing this form, you voluntarily agree to participate in this project. You may withdraw from the project at any time. You may decline to participate in any part of it or decline to answer any questions without prejudice. Any information obtained from you during the course of your

participation will remain confidential and will be used solely for scientific purposes. You may keep a copy of this consent form if you would like one.

Name (please print)

Name (signature)

Date

ID Number (SS#)

APPENDIX D

Debriefing

Debriefing Statement

Now that you have finished all of the tasks included in the experiment, I want to take a minute to explain some things to you about this study. Our primary interest in this study was related to your physiological response to the film clips you saw, as well as your ratings of the second film clip. There were 3 film segments used in this study. The first was a baseline or standard film clip which all subjects saw. The other two were seen by different groups of subjects, depending on the condition to which subjects were assigned. These two clips were very similar in content, but differed in the relative amount of violence portrayed in them. One of the hypotheses of the experiment was that subjects who saw the relatively more violent film clip would show different physiological reactions to the film than subjects who saw the less violent film clip. Also, subjects participated in groups of different sizes. Some subjects watched the film clips by themselves, while others watched the films in groups of either 3 or 5, depending on condition. Previous research in this area has indicated that group size has an effect on physiological reactions to arousing stimuli, such as violent or aggressive acts, such that subjects in groups may show decreased arousal as compared to lone subjects. Therefore, another hypothesis of the study was that subjects who viewed the film clips alone would show heightened physiological responses during the viewing of the films, as compared to subjects who viewed the film clips in groups. Furthermore, we hypothesized that subjects who viewed the more violent film clip alone, as compared to those who viewed this clip in groups, would rate the film clip as more violent.

The results of this study are intended to provide us with valuable information regarding the effects of group size on viewing arousal-inducing

stimuli. Depending on the outcome of this study, future studies will be planned to investigate this group size effect in other similar situations. We appreciate your participation in this study and also would like to ask you not to talk about this experiment with other people, especially those in your Psychology 1 class, as they may later serve as participants in this study. Do you have any questions?

TABLE 1
Mean Systolic Blood Pressure (in mmHg) at Baseline
and Peak response During Film Viewing for Both Films

Table 1. Mean systolic blood pressure (in mmHg) at baseline and peak response during film viewing for both films.

	Baseline	Peak during viewing
"Karate Kid III"	109.33 _a	113.40 _b
"Gorillas in the Mist"	111.25 _c	110.75 _c

Note. Figures with different subscripts, within each row or column, differ significantly, $p < .001$.

TABLE 2

Mean Diastolic Blood Pressure (in mmHg) at Baseline
and Peak response During Film Viewing for Both Films

Table 2. Mean diastolic blood pressure (in mmHg) at baseline and peak response during film viewing for both films.

	Baseline	Peak during viewing
"Karate Kid III"	70.54 _a	76.65 _b
"Gorillas in the Mist"	71.21 _a	72.37 _a

Note. Figures with different subscripts, within each row or column, differ significantly, $p < .001$.

FIGURE 1a

Mean Heart Rate by Viewing Group Size for the Violent Film

Figure 1a. Mean heart rate by viewing group size for the violent film.

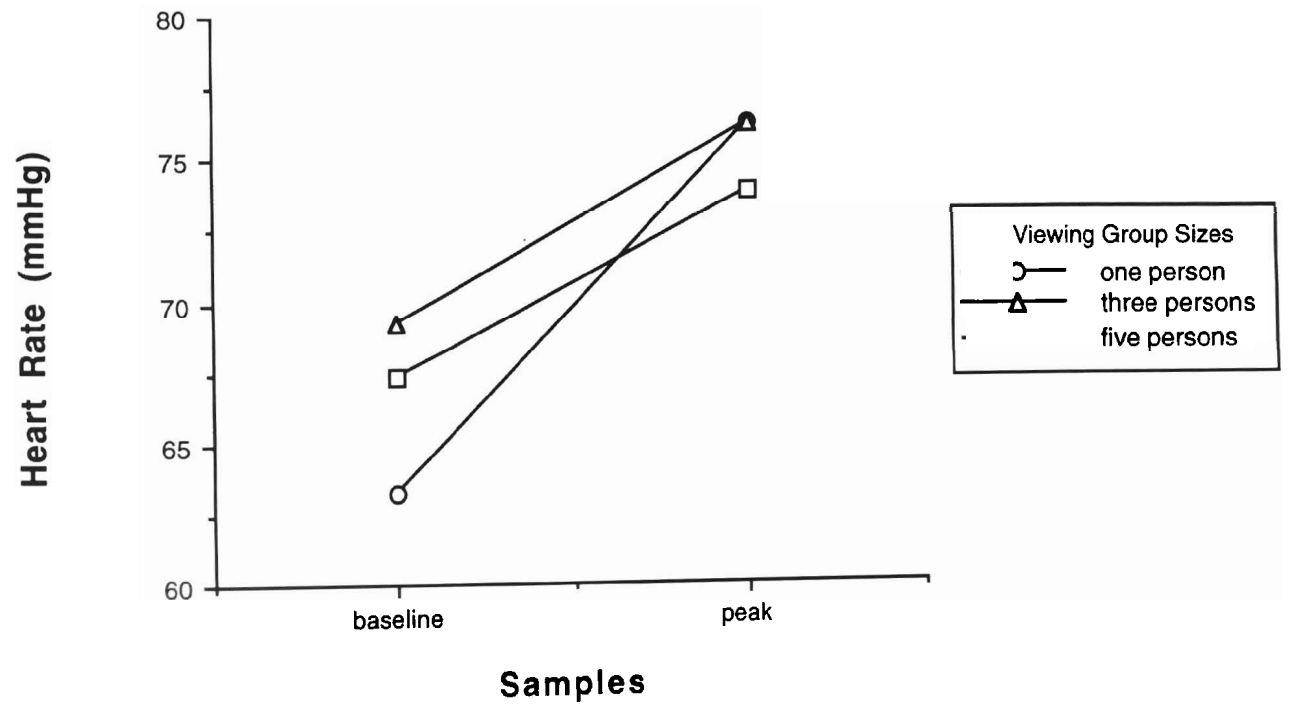


FIGURE 1b

Mean Heart Rate by Viewing Group Size for the Nonviolent Film

Figure 1b. Mean heart rate by viewing group size for the nonviolent film.

